REMARKS

Claims 6-13 are now pending in the application. Original claims 1-5 have been canceled without prejudice or disclaimer, and new claims 6-13 added without introduction of new matter. Favorable reconsideration is respectfully requested in view of the above amendments and the following remarks.

Claims 1-5 stand rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite. This rejection has been rendered moot by the cancellation of claims 1-5, and should therefore be withdrawn. Applicants have been careful to ensure that the wording of the new claims 6-13 does not raise the same concerns as those expressed in the Action.

Claims 1-2 stand rejected under 35 U.S.C. §102(b) as allegedly being anticipated by US Patent Number 5,375,215 to Hanawa et al. ("Hanawa"). Claim 1 also stands rejected under 35 U.S.C. §102(b) as allegedly being anticipated by PCT International Publication Number WO 80/01421 to Sullivan et al. ("Sullivan"). Claim 3 stands rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Hanawa in view of US Patent Number 5,838,603 to Mori et al. ("Mori"). Claim 4 stands rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Hanawa in view of US Patent Number 5,467,459 to Alexander et al. ("Alexander"). Claim 5 stands rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Hanawa in view of US Patent Number 4,517,656 to Solimeno et al. ("Solimeno").

Each of these rejections has been rendered moot by the cancellation of claims 1-5. Accordingly, it is respectfully requested that these rejections be withdrawn.

New claims 6-13 have been added without introduction of new matter. Support for these claims may be found in the specification at, for example, line 14 of page 26 to line 19 of page 28. These claims are believed to be patentably distinguishable over the prior art of record. In considering the patentability of these new claims, the Office is asked to consider the following remarks.

The invention is set in the context of a data-handling bus structure. A discussion of some of the problems associated with known bus structures occupies a considerable proportion of the specification as a means of emphasizing the importance of permitting nodes spaced along the bus to communicate, virtually at will, without tying up the bus structure such that other nodes cannot access it. Not every node is enabled to grab the bus with equal priority to other nodes, so a tiered hierarchy can be adopted. More importantly, a split bus architecture can have enormous benefits in cutting down on the time that the bus is in use for

handling a transaction. The specification therefore describes a number of different bus architectures where separate buses may be used for transaction control as opposed to packet transmission. The bus structure can be split further into separate read and write buses for the same purpose. All of these options are fully described in the specification. They form a background to the features that characterize the invention in its broadest sense.

When the above options are carried through to the limit, a further problem arises in that data packets lose their relative time sequence. Thus, as described on page 26, lines 15 to 31, if a master module (i.e., a requesting module) requests data from more than one target module (i.e., addressed modules), the data received by the requesting module may not be in the correct order, that is, in the order as requested. Steps therefore have to be taken so that, for instance, a packet is returned to the requesting node rather than being misdirected to another node simply because of the packet timing. An aspect of the present invention achieves this by a combination of three features, namely:

1. the node initiating a request for data indicates the packet address and provides sequence data that relates the timing of that request relative to other requests issued by the same node;

2. returned data packets and associated sequence data can be returned in any order; and

3. a storage area re-sequences the returned data packets by the steps of (i) placing them in respective storage locations according to the associated sequence data and (ii) transferring the stored packets to the requesting node in accordance with the order of storage locations in the storage area.

As particularly described, especially in the description from line 14 of page 26 to line 19 of page 28, with reference to Figures 28 and 29, returned packets are buffered in a store, where they are placed in locations dependent on their sequence data, but are read out in strict rotation. Any "sorting" of the packets is therefore carried out at the time that they are placed in the buffer. Clearly, this can only be done if the packets are assigned some sort of tag that identifies the packet's temporal position relative to others. Hence the assignment of sequence data as the first of the three features indicated above. There is also a benefit to the speed of operation of the device in that re-ordering is performed at the time the data packets are returned, rather than when the data is accessed by the requesting module. The returned data is ready and waiting, so to speak.

Turning now to the documents cited in the Office Action, Applicants cannot see any disclosure where data packets are re-ordered or re-sequenced in this way. Consider first the disclosure in Hanawa. From a consideration of page 8, lines 21-35, Hanawa describes a system in which target modules process requests from the same (master) device by latching requests in a FIFO and processing them in arrival order. There is no mention either of (re)ordering the packets at the requesting module nor of the use of sequence data. Indeed the situation does not arise in Hanawa because the requests are handled in succession. There is naturally an increased potential for greater latency in this approach. In Applicants' specification, the benefits of reduced latency provided by the invention are discussed at length.

Considering now the Sullivan document, temporary storage buffers are provided at each (target) module to store requested data or the requests themselves (see page 16, paragraph (b)). The detail of the packet fields in page 24, lines 11-20 makes no provision for sequencing data. Sullivan operates in accordance with a completely different approach as compared to Applicants' invention and makes no reference to sequencing data.

Accordingly, new independent claim 6 contains two significant features. The first is contextual, providing the bus structure by which the modules are able to communicate. The second relates entirely to the sequencing function and is believed to be sufficient to patentably distinguish the invention over the prior art of record. In particular, claim 6 defines:

Apparatus for a computer system comprising:
a bus architecture;
a plurality of modules connected to the bus architecture;
means for receiving data requests from modules for respective required data packets, each request including address data indicating the location of the data packet concerned, and sequence data indicating the timing of the request relative to other data requests issued by the module concerned;
means for receiving returned data packets and associated sequence data;
a storage area associated with each requesting module for storing the returned data packets in respective storage locations therein, in an order indicated by the associated sequence data; and
transfer means for transferring data packets from the storage area to the requesting module in the order of the storage locations in the storage area.

The claim therefore captures the mechanism for a module issuing a request for a data packet, the request including (a) the data packet's address and (b) sequence data indicating

Application No.: 10/827,361
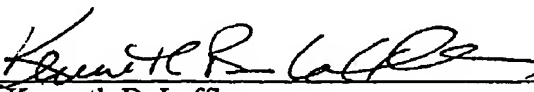Attorney Docket No. 0120-028
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the temporal position of that request relative to other requests issued by the same module. When the requesting module receives a requested packet and associated sequence data, the packet is buffered by placing it in a storage area in a position allocated according to the sequence data and is subsequently transferred from the storage area in the order of the storage locations, that is, in strict rotation, thereby assuring re-ordering of the packets into the correct temporal sequence.

Because it is believed that these features are not disclosed in the prior art of record, it is respectfully submitted that new independent claim 6 is patentable to the Applicants. New dependent claims 10 to 13 merely repeat the same additional subject matter as was defined by original claims 2 to 5 respectively, and claims 7 to 9 simply relate to particular features specifically described in the context of the invention claimed in claim 6. These dependent claims are believed to be patentable at least because they inherit the same novel and nonobvious features defined by claim 6, from which they depend.

The application is believed to be in condition for allowance. Prompt notice of same is respectfully requested.

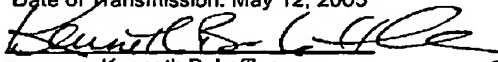Respectfully submitted,

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